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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,047	08/09/2001	Victor Mashayekhi	16295.0672	4108

7590 06/30/2004

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EXAMINER

BONZO, BRYCE P

ART UNIT	PAPER NUMBER
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2114

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,047

Applicant(s)

MASHAYEKHI ET AL.

Examiner

Bryce P Bonzo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 11-16, 20-22 and 24 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10, 17-19 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Non-Final Rejection

Status of the Claims

Claims 1-10, 17-19 and 23 are pending.

Claims 11-13, 14-16, 20-22 and 24 are non-elected.

Claim 10 is rejected under 35 USC §102.

Claims 1-7, 17-19 and 23 are rejected under 35 USC §103.

Claim 9 is rejected under 35 USC §112.

Claim 8 is allowed.

Restriction/Election

Restriction to one of the following inventions is required under 35 U.S.C.

121:

- I. Claims 1-10, 17-19 and 23 are, drawn to weighting of fault tolerant devices for takeover, classified in class 714, subclass 3.
- II. Claims 11-13, drawn to handover after failure based on order of entering a cluster, classified in class 714, subclass 4.
- III. Claims 14-16, 20-22 and 24 are, drawn to selecting fail over servers based on the time of the failure, classified in class 714, subclass 4.

The inventions are distinct, each from the other because of the following reasons:

Inventions I, II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have

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different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions all select a server for take over via mutually exclusive mechanisms- load, order of entry, or time of failure.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Roger Fulghum on 6/23/04 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-10, 17-19 and 23. Affirmation of this election must be made by applicant in replying to this Office action. Claim 11-13, 14-16, 20-22 and 24 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Rejections under 35 USC §112, first paragraph:

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 9 describes the operation of the method of

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claim 8 determining based on resources needed by the applications on a failed node. Claim 8 describes the determining based on needs of the failed node as a whole. This in combination with the prioritization claimed in claim 9 creates a contradiction as to whether the application or the node as a whole defines what is needed and further if the node as a whole defines what is needed, then the prioritization based on application needs is not possible.

Rejections under 35 USC §102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Wolff (United States Patent No. 6,067,545).

As per claim 10, Wolff discloses:

10. A failover method for a computer system having at least three nodes operating as a cluster, said method comprising the steps of:
determining a weight of each of said at least three nodes (column 29, 43-59);
ordering said at least three nodes according to their respective increasing weights from lowest to highest (column 29, 43-59);

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creating a queue containing said ordered nodes, wherein said first node in said queue has the lowest weight (column 29, lines 43-52); and

following failure of one of said at least three nodes, assigning said first surviving node in said queue as a failover node (column 29-43), and

failing over applications running on said failed node to said failover node (column 29, lines 43-59).

As per claims 17 and 18 Wolf discloses:

17. A cluster computer system comprising: at least three nodes, wherein said at least three nodes are computer systems operating as a cluster, wherein said cluster computer system is capable of implementing a failover policy in which, following failure of one of said at least three nodes, the weight of surviving nodes is determined, and a failover node is selected based on said determined weights (column 2, lines 57-64).

18. The cluster computer system according to claim 17, wherein the cluster computer system is further capable of determining said weights by examining performance indicators of said surviving nodes (column 2, lines 57-64).

Rejections under 35 USC §103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 17-19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolff (United States Patent No. 6,067,545).

As per claim 1-6, Wolff discloses:

1. A failover method for a computer system having at least three nodes operating as a cluster, said method comprising the steps of:

following failure of one of said nodes, determining the weight of at least two surviving nodes (column 2, lines 57-64; column 20, lines 20-40);

determining which of said at least two surviving nodes has the *highest* weight (column 29, lines 49-57; column 25, lines 34-37);

assigning applications running on said failed node to said surviving node having the *highest* determined weight (column 27, lines 8-11).

Wolff does not explicitly disclose the use of the *lowest* weight. Wolff's system uses the same resource data information and roughly the same algorithm as Applicant to determine the best candidate for load balancing by having the candidate's weight appear at the end of a spectrum. Wolff adjusts his normalized scale to read the best candidate as having the highest weight, measuring "suitability for load balancing." Another equivalent would be to use a scale which

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takes the inverse of the suitability and produces a low number having the same suitability indicating "lowest current load." The same result is generated for the same purpose, selecting the best candidate with the lowest current load for load balancing. Thus it would have been obvious to one of ordinary skill in the art at the time of invention substitute the mathematical equivalent of the lowest value into the Wolff's highest value to indicate the best candidate for selection for load balancing.

2. The method according to claim 1, wherein in said weight determining step, the weight of every one of said surviving nodes is determined (Figure 7A-D show ever server involved).

3. The method according to claim 2, wherein said weight is determined by evaluating available resources of said node (column 2, lines 37-41).

4. The method according to claim 3, said evaluating step further comprising the steps of: examining at least one performance indicator associated with said node (column 25, lines 21-39); and

using a predetermined method to determine from said at least one performance indicator said weight of said node (column 25, lines 39-50).

5. The method according to claim 4, wherein said at least one performance indicator is an indicator of current CPU utilization of that node (column 8, lines 14: processing capability).

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6. The method according to claim 3, said assessing step further comprising the steps of examining at least two performance indicators associated with said node; and using a predetermined mathematical formula to calculate from said performance indicators said weight of said node (column 8, lines 11-15; column 20, lines 20-40).

As per claim 7, Wolff discloses:

wherein said at least two performance indicators include an indicator of CPU utilization of that node (column 8, lines 11-16).

Wolff does not explicitly disclose the used memory as a performance indicator. Official Notice is given that used and available memory is commonly used to gauge the utilization of a computer resource by those in the computing arts. Used memory is a clear indicator of the amount of load a computer is handling. Thus it would have been obvious to one of ordinary skill in the art at the time of invention include the monitoring of memory in a system with the monitoring of CPU utilization of Wolff to create a more accurate load balancing system which taking into account memory availability.

As per claim 19, Wolff discloses:

19. The cluster computer system according to claim 18, wherein said weight of said node is determined by using a predetermined mathematical formula including data obtained from said performance indicators, and wherein said performance indicators include at least an indicator of current CPU utilization of

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that node and an indicator of the amount of memory currently being used by that node (column 8, lines 11-16).

Wolff does not explicitly disclose the used memory as a performance indicator. Official Notice is given that used and available memory is commonly used to gauge the utilization of a computer resource by those in the computing arts. Used memory is a clear indicator of the amount of load a computer is handling. Thus it would have been obvious to one of ordinary skill in the art at the time of invention include the monitoring of memory in a system with the monitoring of CPU utilization of Wolff to create a more accurate load balancing system which taking into account memory availability.

As per claim 23, Wolff discloses:

23. A failover method for a computer system having at least three nodes operating as a cluster, said method comprising the steps of:

detecting failure of one of said nodes (column 2, lines 57-64);

determining the weight of at least two surviving nodes, wherein for each of said at least two surviving nodes, said weight is determined by evaluating at least a performance indicator indicating current CPU utilization of the surviving node (column 8, line 14);

determining which of said at least two surviving nodes has the lowest weight (column 2, lines 57-64); and

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assigning applications running on said failed node to said node determined to have said lowest weight (column 7, lines 57-64).

Wolff does not explicitly disclose the use of the *lowest* weight. Wolff's system uses the same resource data information and roughly the same algorithm as Applicant to determine the best candidate for load balancing by having the candidate's weight appear at the end of a spectrum. Wolff adjusts his normalized scale to read the best candidate as having the highest weight, measuring "suitability for load balancing." Another equivalent would be to use a scale which takes the inverse of the suitability and produces a low number having the same suitability indicating "lowest current load." The same result is generated for the same purpose, selecting the best candidate with the lowest current load for load balancing. Thus it would have been obvious to one of ordinary skill in the art at the time of invention substitute the mathematical equivalent of the lowest value into the Wolff's highest value to indicate the best candidate for selection for load balancing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryce P Bonzo whose telephone number is (703) 305-4834. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (703) 305-9713.

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Bryce P Bonzo

Examiner

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